grammatic woodcuts.—In the Psychical Section of the Conference M. Letourneau treated of the evolution of morality, tracing the rise and progress and various fluctuations of the moral sense among different races.—M. Pozzi, in announcing the decision of the Committee for awarding the Broca prize, explained that he and his colleagues had selected the works of three among the numerous competitors, viz. MM. Collignon, Chudzinski, and Testut, as of pre-eminent merit. The prize was, however, unanimously awarded to the last-named, M. Testut's great work, "Muscular Anomalies in Man explained by Comparative Anatomy," having secured him this distinction both on account of its able and exhaustive character and its great literary merits. The selected essays of MM. Collignon and Chudzinski, treated respectively of the "anthropometric differences of the leading races of France," and of the "Anatomy of the Negro." In his address M. Pozzi gave a summary of M. Testut's work, of which he spoke in terms of unqualified praise, both as regards the methods with which his observations had been conducted, and the manner in which the results were compared and tested.—Report of the eulogy on Paul Broca, delivered by M. Dally on the day the Broca prize was awarded for the first time. As an old friend and colleague, M. Dally, in his historical and literary notice of the life and works of Broca, was able to give many hitherto unknown particulars, which add largely to the interest of his address.

Bulletins de la Société d'Anthropologie de Paris, 1er Fascicule, 1885, containing *résumé* of the rules, organisation, and actual condition of the Society, with lists of members, affiliated societies, and recent obituary, &c., &c., &c. Among the works presented to the Society at its inaugural meeting, 1885, special notice is due to the "Elements of General Anthropology," by M. Topinard, who here gives a *résumé* of his lectures at the School of Anthropologie since 1876; the "Gitaños of Spain and Portugal," by M. Bataillard; "Ethnic Mutilations," by M. Magitot; and "Cannibalism among the Red-Skins," by M. Letourneau. In regard to each of these, the authors treated at great length of the objects aimed at in their respective works, the character and scope of which they fully explained.—M. Chudzinski presented the Society with the cast of the deltoid muscle of a negro, showing an anomalous separation of the bundles, which had a Simian character.—M. Delisle drew attention to an ox's head belonging to *Bos indicus* of Senegal, in which a perfectly developed horn protruded from between the nasal bones.—A paper by Dr. Hoffman, of Washington, on a curious relic found in South California, supposed to have been a case for keeping the colouring-matters and instruments employed in tattooing.—On the Quaternary deposits of Rosny (Nogent-sur-Marne), by M. Eck. Among these finds are fine teeth of *Elephas primigenius*, *Rhinoceros tichorhinus*, *Equus*, &c.—Report by M. Gouïn, of Cagliari, on the skulls and objects found by M. Issel in the recently-opened cave at Orreri, in the Island of Sardinia. M. Issel believes, from his study of the prehistoric remains of Western France, Spain, and the basin of the Mediterranean generally, that these and the finds at Orreri all point equally to the diffusion of a primitive race, which was extant in the Canary Isles within historic times.—On Laos, by M. P. Neis, who explored the Laotian territory bordering on Cambodia in 1882-84. The author, as a French official, enjoyed exceptional advantages for travelling in Cochin China and the neighbouring districts, and his careful study of the character and habits of the people has enabled him to collect much interesting information regarding the distinctive anthropological and social characteristics of the different races of Indo-China. M. Neis sees no ground for the opinion that these races exhibit traces of a Negrito element, but he draws attention to the fact that everywhere the Mongol is displacing the Thay and other ancient nationalities, although this is most evident in the territories between Mam-on and Tonkin, and he believes that, unless the King of Siam takes prompt measures to stop this invasion, Siamese supremacy and French authority will be alike endangered.—Ceylon and its inhabitants in ancient and modern times, by M. Beauregard. The author derives his materials from English sources.—On the caves of Saumoussay, by M. Bonnemère, who believes that these grottoes served in prehistoric ages as a tannery.—On the measurements of the long-bones as a basis for the reconstruction of the entire skeleton, by M. Topinard, with plates of the osteometric instrument used by Broca.—On will, considered from a physiological point of view, by M. Fauvelle.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 7, with a note added May 12.—"On the Electric Resistance of a New Alloy named Platinoid." By J. T. Bottomley, M.A., F.R.S.E.

In the course of a series of experiments on the electric resistance of various metals and alloys and in particular on the variation of the electric resistance of these metals and alloys with temperature, the author has examined a new alloy (called by the inventor "platinoid"), which has turned out to have important properties.

This alloy is the invention of Mr. F. W. Martino, of Sheffield, who kindly supplied specimens of the metal, and wires specially drawn down to the finer gauges for experiments.

Platinoid is practically German silver with the addition of a small percentage (1 or 2 per cent.) of metallic tungsten. The tungsten is added in the form of phosphide of tungsten, a considerable percentage of which is in the first place fused with a portion of the copper. The nickel is then added; and then the zinc and the remainder of the copper. The mixture requires to be re-fused more than once, and during the process the phosphorus and a considerable portion of the tungsten originally added is removed as scoriæ. In the end there is obtained a beautiful white alloy, which is platinoid. When polished the alloy is scarcely distinguishable in appearance from silver. To test the quality claimed for it as to being untarnishable, the author has been keeping ornamental specimens lying exposed to the ordinary town atmosphere; and has satisfied himself that the alloy has a very remarkable power of resisting the tarnishing influence of the air of a large town.

It is, however, the electric resistance of platinoid that has chiefly interested the author. German silver wire has proved of great use in the construction of galvanometer coils and resistance coils, on account of two important properties, viz., its very high resistance and the smallness of the variation of its resistance with change of temperature. Both those properties are possessed in a still higher degree by platinoid alloy.

The resistance of German silver differs considerably in different specimens. It is commonly stated to be $21{\cdot}17 \times 10^{-6}$ B.A. ohms between opposite faces of a centimetre cube at 0° C.;[1] or, reducing to legal ohms, $20{\cdot}935 \times 10^{-6}$ legal ohms between the opposite faces of a centimetre cube. The following table shows the resistance of a number of specimens of platinoid wire:

Specifying number	Diameter in decimals of a centimetre	Cross Section	Resistance legal ohms per metre	Resistance between opposite faces of a centimetre cube legal ohms.
16	·1610	·0204300	·181	$36{\cdot}98 \times 10^{-6}$
17	·1430	·0160200	·202	32·36
18	·1230	·0119400	·288	34·38
19	·1110	·0096770	·353	34·16
20	·0865	·0058760	·555	32·61
A	·0595	·0027180	1·250	$34{\cdot}76 \times 10^{-6}$
B	·0495	·0019240	1·707	32·85
28	·0402	·0012690	2·605	33·06
29	·0340	·0009070	3·412	30·94
32	·0290	·0006605	4·371	28·87
36	·0220	·0003801	8·219	31·24

It appears from these results that the specific resistance of platinoid is about *one and a half* times that of German silver.

The experiments on the variation of resistance of platinoid with temperature were carried on in the following way. The specimen of platinoid to be tested was wound on a wooden bobbin, on the surface of which a screw had been cut, and the spires of the helix were kept separate by lying between the threads of the screw. This coil was immersed in a bath of oil, and was connected in series with a known wire of German silver, the temperature of which was kept constant, and with a single Daniell's cell. The differences of potential between the two ends of the platinoid wire and the two ends of the German silver wire were determined by applying the electrodes of a a high-resistance galvanometer. The ratio of the differences of potential is the same as the ratio of the resistances of the two wires.

[1] Given by Prof. Fleeming Jenkin, F.R.S., as expressing the results of Matthiessen's experiments.

In the following table is shown the ratio of the resistances of a specimen of platinoid wire at different temperatures to its resistance at zero. The wire used was the same as that specified as No. 20 in the table of resistances. The length of the wire experimented on was about four-fifths of a metre. The only trouble in the experiment was the keeping the oil-bath, which was filled with linseed oil, thoroughly stirred, and of uniform temperature throughout.

Temperature.	Resistance. The Res. at 0° C. being = 1.
0°	1·0
10	1·0024
20	1·0044
30	1·0075
40	1·0066
50	1·0097
60	1·0126
70	1·0134
80	1·0166
90	1·0188
100	1·0209

This gives for the average percentage variation of resistance per 1° C., between the temperatures 0° C. and 100° C., the number 0·02087. A second wire tested very carefully in a similar way gave for this average percentage variation between 0° and 100°, 0·022 per degree, with a steadily increasing rate of variation from the beginning.

To compare this increase in resistance due to increase of temperature with that observed in other metals and alloys, we find that the percentage increase of resistance for 1° C. at 20° C. for copper is 0·388, platinum-silver alloy 0·031, gold silver alloy 0·065, and for German silver 0·044. These numbers were obtained by Matthiessen in the course of his experiments for finding a suitable metal or alloy for the purpose of constructing the British Association standards of electric resistance. It appears that the variation of resistance of platinoid with temperature is very much smaller than the smallest observed for any of the metals and alloys then examined.

The modulus of rigidity, the Young's modulus (or modulus for elastic longitudinal extension), and the breaking weight for platinoid wire were also determined. The wire used was a portion of that marked *A* in the foregoing table. This wire is a little larger than No. 24 of the Board of Trade standard wire gauge, and has a diameter of 0·0595 cm.

The rigidity modulus was found to be $4751{\cdot}8 \times 10^6$ grammes weight per square centimetre. The Young's modulus is $1222{\cdot}4 \times 10^6$ grammes weight per square centimetre.

The breaking weight is about $6{\cdot}029 \times 10^6$ grammes weight per square centimetre.

The specific gravity of platinoid wire has also been found by the author to be 8·78 compared with water at 20° C. Platinoid when drawn hard is softened, like copper, by heating and sudden cooling.

Physical Society, May 23.—Prof. Guthrie, President, in the chair.—Dr. A. H. Fison was elected a Member of the Society.—The following communications were read:—Experiments showing the variations caused by magnetisation in the length of iron, steel, and nickel rods, by Mr. Shelford Bidwell. The subject of the extension and retraction of bars of iron and nickel under the action of magnetic force has been investigated by Drs. Joule and A. M. Mayer, and by Mr. Barrett. In the present experiments the magnetising force has been increased, with the result of bringing out some striking and novel characteristics. The apparatus employed consisted of a vertical magnetising helix considerably longer than the experimental rod, the latter forming the central portion of a compound rod, the two ends being of brass. The lower end of this rod is plane, and stands on a firm support; the upper end is a knife-edge, which bears against a brass lever 18 cm. in length, about 1 cm. from the fulcrum; the portion of the rod to be examined is in the central portion of the helix. The above lever is furnished with another knife-edge at the end, which acts in a similar manner on a second lever, at the extremity of which is a small mirror. A lamp and vertical scale being placed at a distance of 470 cm., the slightest motion of the mirror could be read with great accuracy, an elongation of the bar, amounting to 1-100,000th mm., being easily detected. A few of the more important results are as follow:—In the case of soft iron the bar continually increased in length till nearly saturated, up to which point Mr. Joule had traced it, but then it reached a maximum, decreased, and continued decreasing to the limit of the experiments, at which point the retraction was about double of what the extension had been. The effect depended upon the thickness of the bar, an increase of diameter diminishing the maximum extension, and increasing the critical magnetising force, or that force which produced the maximum extension; the results seemed to show that this extension varied inversely as the square root of the diameter of the bar. The general behaviour of steel was the same as that of soft iron, but the critical point varied with the hardness and temper of the metal, appearing to be a minimum for steel of yellow temper. The results of experiments upon nickel coincided with those obtained by Prof. Barrett, the effect of magnetisation being to cause a continuous retraction greater than that obtained with soft iron. In answer to Prof. Hughes, who believed that the effect of the coil was always to produce *retraction* of the bar, the *extension* at first being due to the molecular arrangement of the particles during magnetisation, Mr. Bidwell further described an experiment showing that the action of the coil was to produce the *extension* of a magnet. Two thin strips of soft iron fastened together at the ends, their central portions being about 2 cm. apart, were placed in the coil. On making the current the ends were drawn out, the sides coming together. Prof. Forbes suggested that the effect of thickness was really owing to the irregularity of magnetisation produced by the ends, and that in future experiments the middle of the bar only should be examined.—On the spectral image produced by a slowly rotating vacuum-tube, by Mr. Shelford Bidwell.—Note on the action of light in diminishing the resistance of selenium, by Mr. Shelford Bidwell. As the result of the investigation upon the behaviour of selenium, Messrs. Adams and Day arrived at the conclusion that it conducted electrolytically. Since this would necessitate the assumption that selenium is not an element according to accepted theories, caution must be exercised in accepting this. It seemed possible, however, that since the selenium in the cells had always undergone a prolonged cooking in contact with the metal terminals, selenides of these metals might exist in the selenium, forming a kind of network, and thus affording conduction through the mass, which, without the cooking, is non-conducting. It had not been possible to test this directly, but a somewhat analogous case had been tried. Some precipitated silver had been heated for some hours with sulphur, and the clear liquid poured off. A cell was then made by coiling two silver wires side by side upon a strip of mica, the spaces between the wires being filled with the prepared sulphur, which would contain a small quantity of sulphide of silver. It was found necessary to reduce the resistance of the cell by placing a small strip of silver leaf over the sulphur and cooking again. The cell thus prepared was very sensitive to light: by burning a piece of magnesium near, the resistance was reduced to one-third. Mr. Clark said that Mr. Bidwell's cells probably contained sulphides of copper or silver, substances which the researches of Faraday had shown conducted electrolytically in the solid condition. On the other hand, Cu_2Se and Ag_2Se conducted like metals and were probably often present in the ordinary selenium light cells. Mr. Clark thought that Mr. Bidwell's paper raised this question: What influence had light upon the electrolytic conduction of Cu_2S and Ag_2S and upon the metallic conduction of Cu_2Se and Ag_2Se?—On certain cases of electrolytic decomposition, by Mr. J. W. Clark.—The first part of this paper consisted of a critical examination of the behaviour of those substances which have been described as exceptions to Faraday's laws, with the object of generalising as to the condition of internal or molecular structure corresponding to their electrical properties. The second part described an experimental investigation into the nature of the conduction of fused mercuric iodide and mercuric chloride, both of which were stated to undergo electrolytic conduction. Decomposition and re-combination of the products of electrolytic action may, however, follow so closely as to simulate metallic conduction. The first product of electrolytic decomposition of mercuric iodide was stated to be iodine and mercuroso-mercuric-iodide (Hg_4I_6), which latter, under the continued action of the current, yields free mercury. Similarly it was found that fused mercuric chloride, when electrolysed between graphite terminals, split up into chlorine and mercurous chloride. Metallic conduction, *i.e.* conduction without decomposition, in fused compound solids, therefore appears to be unknown.—Note on electrical symbols, by Mr. J. Munro.

Mathematical Society, June 11.—J. W. L. Glaisher, F.R.S., President, in the chair.—Prof. J. Larmor was admitted

into the Society.—Mr. Basset read a paper on the potential of an electrified spherical bowl, and on the motion of an infinite liquid about such a bowl, upon which Prof. Larmor made some remarks.—Mr. Elliott communicated a short paper by M. Z. J. Rogers, entitled, notes on the polism of the inscribed and circumscribing polygon.—Mr. Kempe, F.R.S., made a brief communication on pairs of collinear points; and a paper by Prof. Mannheim, liaison géométrique entre les sphères osculatrices de deux courbes qui ont les mêmes normales principales, was taken as read.

Chemical Society, June 4.—Dr. Hugo Müller, F.R.S., President, in the chair.—Mr. Harold Follows was admitted as a Fellow of the Society.—The following paper was read:—On the constitution of the haloid derivatives of naphthalene, by Prof. Meldola.

Anthropological Institute, June 9.—Francis Galton, F.R.S., President, in the chair.—Prince Roland Bonaparte exhibited a large collection of photographs of Lapps.—Mr. P. A. Holst exhibited three water-coloured photographs out of a collection of 240, representing all the tribes of the Russian empire.—Dr. J. G. Garson read a paper on the physical characteristics of the Lapps; and by the permission of the authorities of the Alexandra Palace, the family of Lapps now being exhibited there were present in the room with their sleigh, reindeer skins, and dog. The group consists of three men, two women, and two young children. The average height of the men is 5 feet 1½ inches, that of the women 4 feet 11½ inches. The chief characteristics of the Lapps may be said to be their low stature, round heads, and large cranial capacity.—Prof. Keane read a paper on the Lapps: after glancing at their origin, ethnical relations and nomenclature, explaining the perplexing terms Lapp, Finn, Same, &c., the Professor proceeded to describe their present habitat, their national and political divisions, and population; not more than about 30,000 Lapps remain, and their number appears to be diminishing. Their social usages were then described, and allusion made to their reindeer, dogs, sledges, snow-shoes, and tents, and the paper concluded with an account of their religion, education, present condition, and future prospects.—A paper by Dr. H. Rink on Eskimo dialects was taken as read.

EDINBURGH

Mathematical Society, June 12.—Dr. Thomas Muir in the chair.—Prof. Tait gave an address on the detection of amphicheiral knots, with special reference to the mathematical processes involved.

PARIS

Academy of Sciences, June 8.—M. Bouley, President, in the chair.—Action of chloroxicarbonic ether on the cyanate of potassium, by MM. Wurtz and Henninger. In an accompanying note it is stated that this important posthumous monograph was mostly prepared in 1875, but that its publication was delayed by the authors in order to complete their researches on various points. After the death of M. Wurtz the work was continued by M. Henniger, who was about to publish the results when he also fell a victim to his arduous labours. In its present form the paper has been prepared and edited by M. Edouard Grimaux.—Memoir on the temperature of the atmosphere and ground at the Paris Natural History Museum during the years 1883 and 1884, by MM. Edmond Becquerel and Henri Becquerel. This memoir forms a continuation of the researches begun twenty-two years ago at the Museum by M. A. C. Becquerel, by means of the thermo-electric apparatus invented by him.—On the geographical distribution of animal and vegetable species as affected by the climatic conditions, the character of the soil, the disposition of land and water, the progress of culture, and other outward influences of the environment, by M. Emile Blanchard.—Propagation of the earthquake shock felt in Andalusia on December 25, 1884, a rectification, by M. F. Fouqué.—On a new order of metallic spectra, by M. Lecoq de Boisbaudran.—Note on a new vegetable type from the lower coralline formations of Auxes, in the neighbourhood of Baune, Côte d'Or, by M. G. de Saporta. This type, by the author named Changarniera, from its first observer, appears to be of lacustrine origin, and to bear a certain relation to the Rhizocaulon from the freshwater chalk-formations of the South of France, still surviving in Provence. It may, perhaps, represent one of those proangiosperm types, the existence of which has only begun to be suspected by botanists.—Note on some recently-discovered documents connected with the infancy of Jean Le Rond d'Alembert, by M. L. Lallemand. These inedited records show that, contrary to Condorcet's statement, d'Alembert was sent to the Maison de la Couche, and placed with a nurse for six weeks in a Picardy village, after which he was consigned to the charge of Jacques Molin (Dumoulin), one of the most distinguished physicians of the time.—On a method of rapidly analysing all the nitrogen contained in substances in the organic, ammoniacal, and nitric state, by M. A. Houzeau.—On a method of employing the sextant in such a way as to obtain by a single observation the simultaneous altitudes or angles of two stars, of a star and the moon, or of a star and the sun, by M. Gruey.—On the convergence of a continuous algebraic fraction, by M. Halphen.—Remarks on the radiations emitted by incandescent carbons, such as those prepared for use in lighthouses for the production of voltaic arcs, by M. Félix Lucas.—Remarks on the apparatus usually employed for the measurement of continuous and other electric currents, by M. Mascart.—A thermo-chemical study of electric accumulators, by M. Tscheltzow.—Note on the action of silver, copper, iron, and some other metals on a mixture of acetylene and air, by M. F. Bellamy. The author's experiments show that in the burner these metals, and especially copper, act on acetylene in the same way that platinum does on hydrogen.—Note on the sulphurets of cerium and lanthane, by M. Debray.—On a new reaction for digitaline, by M. Ph. Lafon. This reaction, which is extremely sensitive, will enable the chemist to distinguish more sharply than has hitherto been possible between the numerous products employed in therapeutics under the general name of digitaline.—Note on aseptol (orthoxiphenylsulphurous acid), by M. E. Serrant. For this substance (so named by the author from the Greek negative particle ἀ and σηπτόν, corruption) it is claimed that it will be found three times superior to phenic acid as a practical antiseptic.—On electric alcoholic fermentation, by M. Em. Bourguelot.—Remarks on the tail of the human embryo, by M. H. Fol. From his researches the author is satisfied that during the fifth and sixth weeks of its development the human embryo is furnished with a tail in the strict anatomical sense of the term. Being destitute of all physiological use, this organ must be classed with all other rudimentary members.—On the natural evolution of the cantharides, by M. H. Beauregard. The results are here embodied of three years' research, during which the author has succeeded in clearing up many obscure points connected with the physiological life and functions of these insects.—Note on the extraction and composition of the gases contained in the leaves of plants, by MM. N. Gréhaut and Peyrou.

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